

**Talking Points for 10/22/18 Meeting with Taunton and EPA on Request for NPDES Permit Modification**

**Marine Dissolved Oxygen (DO) Criteria Review**

- MassDEP is actively working on the review of our marine DO criteria and anticipates completing the review along with marine DO criteria recommendations in late 2019.
- MassDEP hired consultants to assist the Department in the review of marine DO criteria. To date we have gathered technical information, and engaged a technical advisory committee (CZM, Fish and Game, HQ, USGS, RIDEM, URI, Great Bay National Estuarine Research Reserve), EPA Region 1, and EPA's experts from Headquarters in the review.
- Other states have DO criteria based on EPA's Virginian Province approach, however we have learned that the science has evolved significantly since EPA's guidance for the Virginian Province was published in 2000, and therefore adopting the approach as is would no longer be appropriate.
- In working with EPA, Massachusetts has developed an approach that builds on EPA's Virginian Province approach while considering new information from the National Marine Fisheries Service (NMFS) and other literature sources.
- EPA must consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service about changes to water quality standards which may affect species listed under Requirements under the Endangered Species Act (ESA) necessitate that EPA review proposed water quality criteria to ensure the provisions of the Clean Water Act and implementation by states are not in conflict with the goals of the ESA.
- Atlantic Sturgeon is listed as a federal endangered species for the New York Bight and threatened for the Gulf of Maine. The species is also listed as an endangered species by the State of Massachusetts.
- The services NMFS identifies all coastal waters from the Chesapeake Bay up to Northern Maine (including all Massachusetts coastal areas) as Atlantic Sturgeon Distinct Population Segments.
- While the marine DO criteria have not been formally submitted to EPA, EPA has been viewing them regarding future consultation with the NMFS.
- Existing data and studies indicate that DO concentrations below 5.0 mg/l may lead to avoidance behaviors and reduced metabolic and feeding rates to Atlantic sturgeon. (TNC,2016) NMFS considers DO levels of 5 mg/l and above as protective of sturgeon and serve as their "No effect" standard. (NMFS BiOp for Florida DO,2016)
- EPA believes that a DO of 5.0 mg/l is likely the minimum criteria which would protect the Atlantic sturgeon and that criteria below that may adversely affect Atlantic sturgeon.
- Preliminary results indicate that the marine DO criteria values in MassDEP's current water quality standards (chronic criteria of 5mg/L for SB Waters, 6 mg/L for SA Waters) are unlikely to change as a result of this review.
- MassDEP anticipates that a future proposed revision to the Marine DO criteria in 314 CMR 4.00 will include new acute marine DO criteria, lower than the current chronic criteria, as well as specificity on the acute and chronic criteria concentration duration and applicable seasonal application.

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- EPA's Virginian Province approach states that where a threatened or endangered species occurs at a site and sufficient data exist to suggest it is more sensitive at concentrations above the criteria, it is appropriate to consider site-specific criteria based on the species. That is the case here. EPA approved the marine DO criteria in RI, CT and NY prior to the listing of the Atlantic sturgeon in 2012 and did not consult on that criteria with respect to the sturgeon. Because science has evolved since 2000, EPA has stated that they would not approve of Massachusetts' adoption of criteria identical to RI, NY, and CT.
- ~~• Requirements under the Endangered Species Act (ESA) necessitate that EPA review proposed water quality criteria to ensure the provisions of the Clean Water Act and implementation by states are not in conflict with the goals of the ESA.~~
- ~~• Atlantic Sturgeon is listed as a federal endangered species for the New York Bight and threatened for the Gulf of Maine. The species is also listed as an endangered species by the State of Massachusetts.~~
- ~~• The services identify all coastal waters from the Chesapeake Bay up to Northern Maine (including all Massachusetts coastal areas) as Atlantic Sturgeon Distinct Population Segments.~~
- As part of the criteria review, the team evaluated numerous species with a broad range of sensitivity and habitat requirements, and looked at associated dissolved oxygen response information that is applicable for criteria development. The review identified Atlantic Sturgeon sturgeon as the most sensitive species for both acute and chronic impacts.
  - The Taunton River and Narragansett Bay (including Mount Hope Bay) are considered foraging habitat for subadult and adult life stages.
  - Because of their sensitivity and endangered status, dissolved oxygen requirements for Atlantic sturgeon were carefully reviewed as they might affect criteria in the study area (Taunton River Estuary and Mount Hope Bay) and in other Massachusetts coastal waters.
  - Multiple endpoints are available in the literature and critical DO concentrations generally range between 3 mg/L and 6 mg/L. Levels greater than 6 mg/l (chronic endpoint) support optimal growth for young-of-the-year and juveniles, whereas increased mortality of eggs, larvae, juvenile and adult organisms is seen at concentrations less than 3 mg/l (acute endpoint).
  - Sturgeon are included in the Virginian Province Approach, which was used to determine that a chronic exposure of  $\geq 5.1$  mg/L was protective of all species in the Taunton River Estuary and Mount Hope Bay study area.
  - A review of growth endpoints as a surrogate for avoidance behaviors suggested that other species (e.g., Winter Flounder) were also protected when DO is  $> 5$  mg/L.
- EPA confirmed during our discussion with the technical team on June 12, 2018 that DO chronic criteria below 5.0 mg/L are not approvable, likely protective of the Federally listed Atlantic sturgeon.
- We have initiated a Phase III Marine DO review to analyze existing data to develop the frequency and duration associated with the criteria magnitude, assessment guidance, and monitoring guidance.

- We anticipate engaging stakeholders in 2019 with our findings and proposed criteria.

### **Monitoring and Assessment**

- MassDEP has funded ongoing collection of water quality information from the two monitoring buoys and is partnering with USGS on the development of a monitoring strategy for the Taunton River Estuary and Mount Hope Bay.
- Water quality data collected from the two monitoring buoys identified the following issues and concerns:
  - Preliminary analysis of provisional data show that the current MassDEP chronic criterion of 5 mg/L and the current RIDEM criterion of 4.8 mg/L were not met for weeks at a time (Bottom Sonde below pycnocline) during July and August of 2017.
  - It is also likely that an acute threshold, if adopted, will not be achieved in Massachusetts for significant periods of time.
- These data demonstrate that the receiving waters in Taunton/Mount Hope Bay are not meeting goals for Aquatic Life support.
- Low DO was observed following events where chlorophyll-a peaks of up to 100 µg/L were observed, which demonstrates that algae blooms were caused by excessive nutrients.

### **Questions for EPA for 10/15 Meeting**

- Can EPA confirm (when in the meeting with Taunton) that they won't approve any DO criteria less than 5 mg/L? EPA believes that a DO of 5.0 mg/l is likely the minimum criteria which would protect the Atlantic sturgeon and that criteria below that may adversely affect Atlantic sturgeon.
- How would EPA act on a permit modification with the new data available? Would EPA take the technical approach used to develop the current permit limit and plug in new data to determine what the limit should be? Or would it be more complicated than that? If the new analysis showed different limits were appropriate for other facilities in the watershed, would EPA expect to modify those permits?
- Neither the Taunton River Watershed Association nor SMAST have a current MassDEP approved QAPP. Without a QAPP in place, how does EPA intend to use these sources of data for assessment purposes and permitting? EPA notes that TRWA has SOPs and trains their volunteers. They also use a MA DEP approved laboratory for water sample analysis. The documentation that they do have is of high quality.
- Please explain how the requirement for consultation with the services impacts EPA approval of a future proposed revision to MassDEP's Marine Dissolved Oxygen criteria.
- Is EPA familiar with the new hydrodynamic modeling Taunton has mentioned?

### **Expected Questions from Taunton**

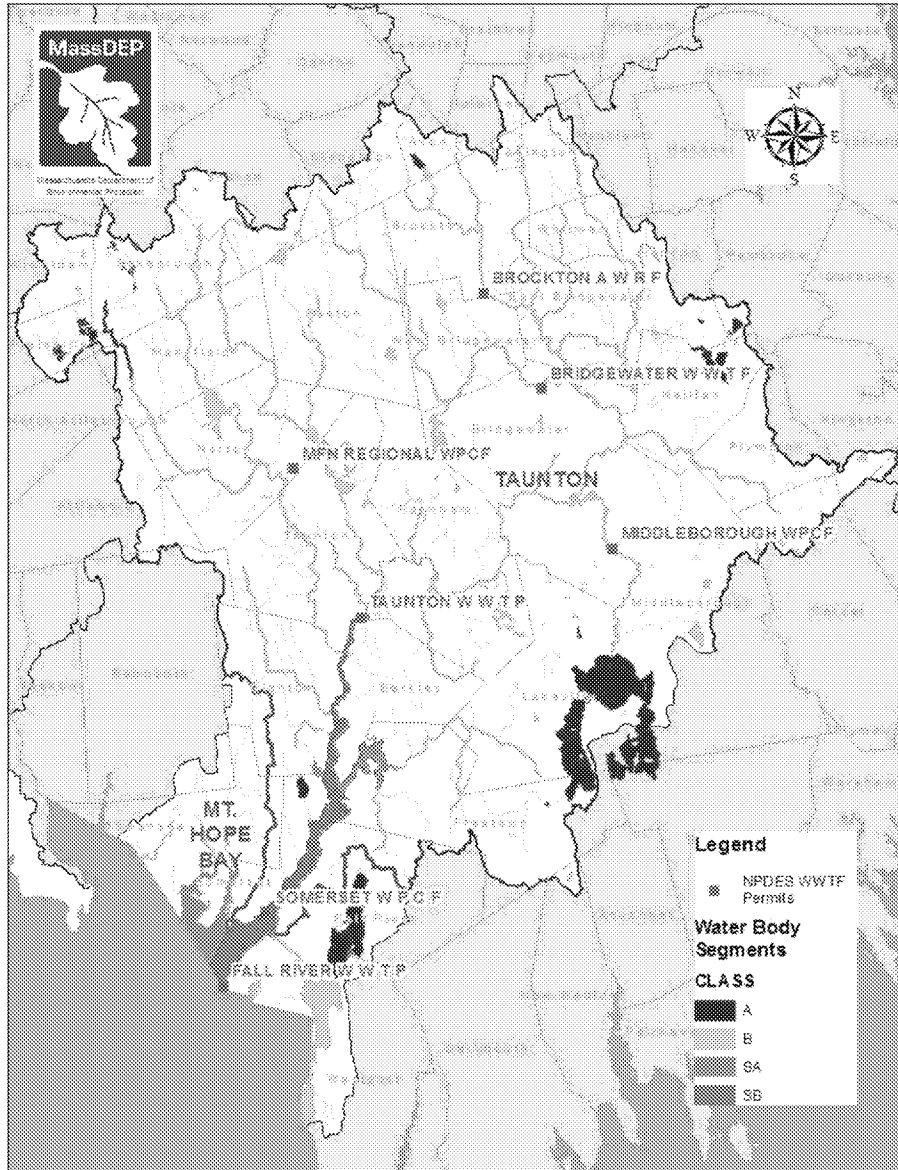
- There are multiple sources of nitrogen in the watershed, so how can you say that Taunton is the cause of the DO impairments seen at the buoys?
- Will EPA act on a permit modification based on new data available?

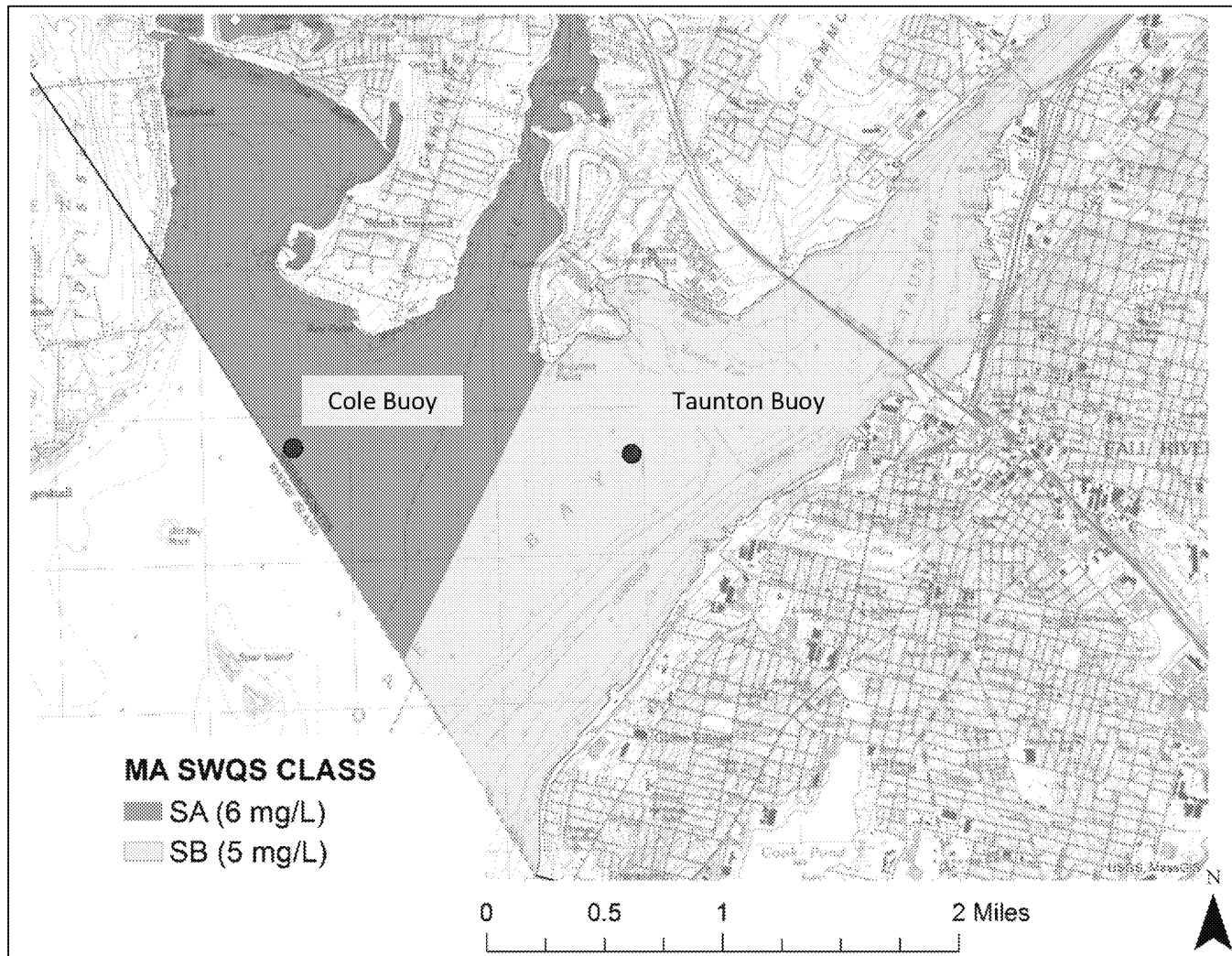
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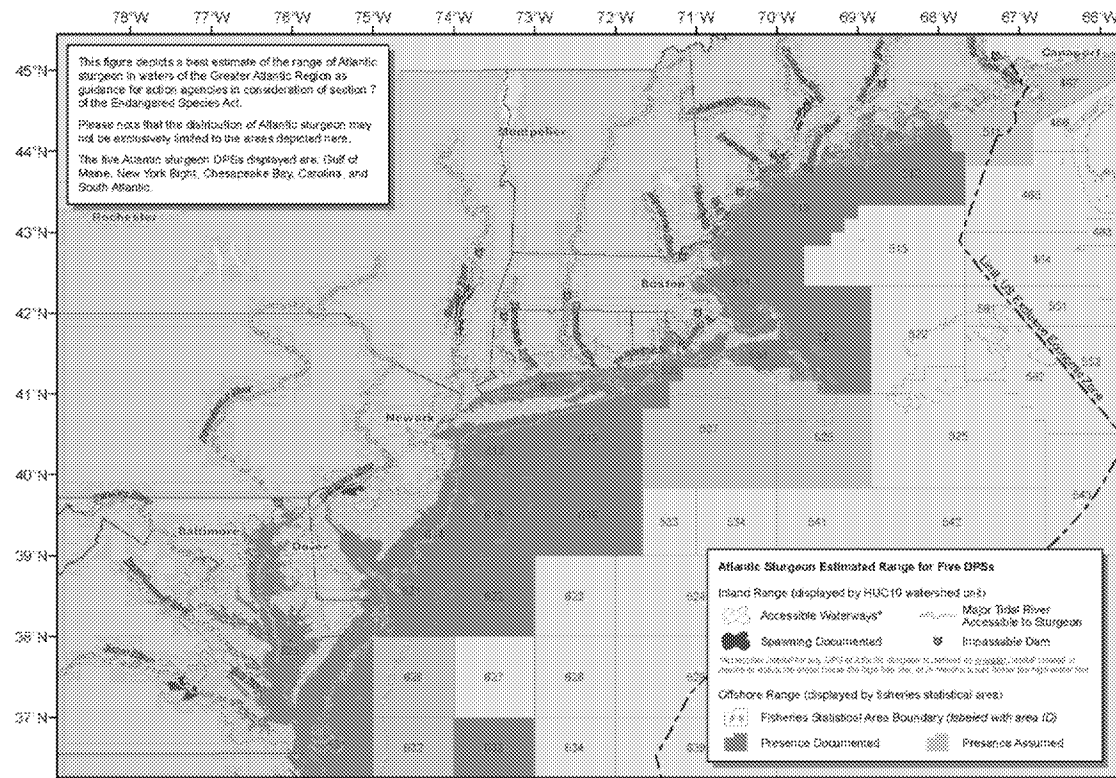
- Does consideration of new information available justify an extension of the compliance schedule?

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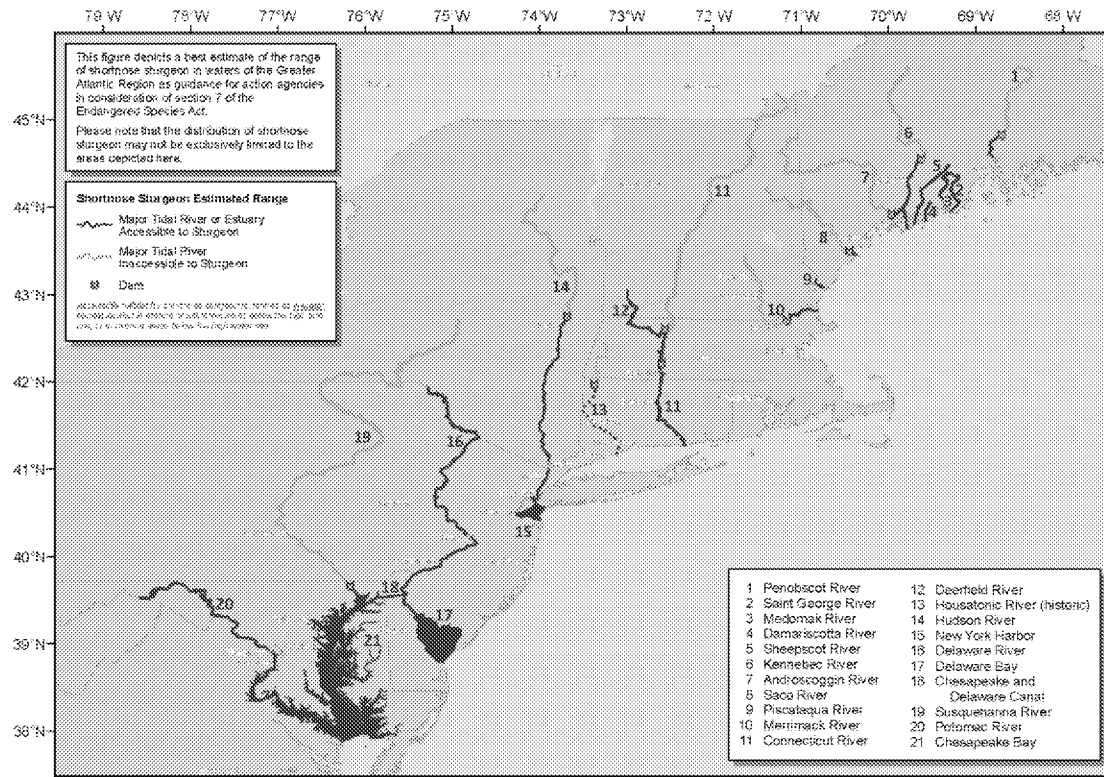




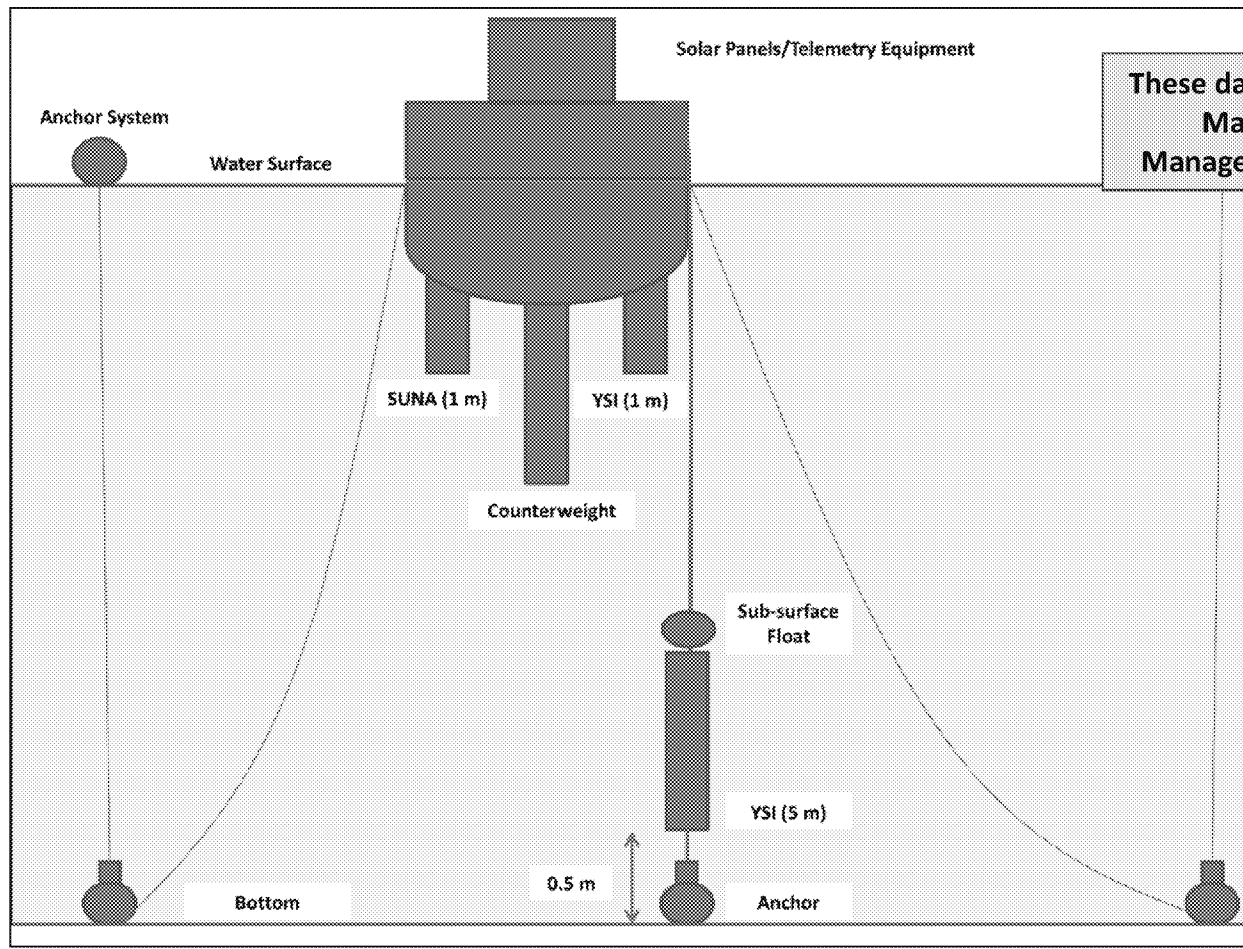
# Estimated Range of Atlantic Sturgeon Distinct Population Segments (DPSs)



## Estimated Range of Shortnose Sturgeon

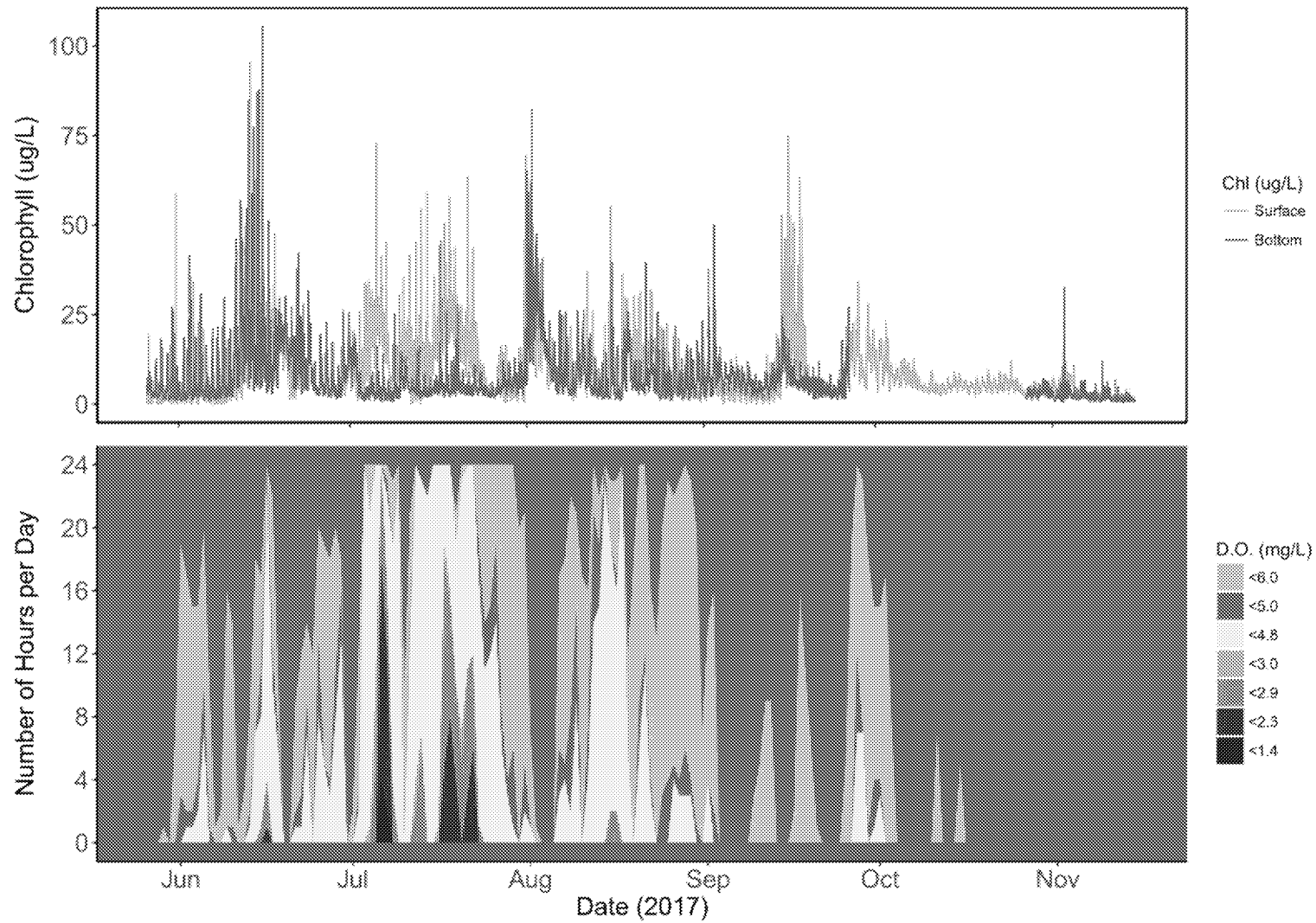






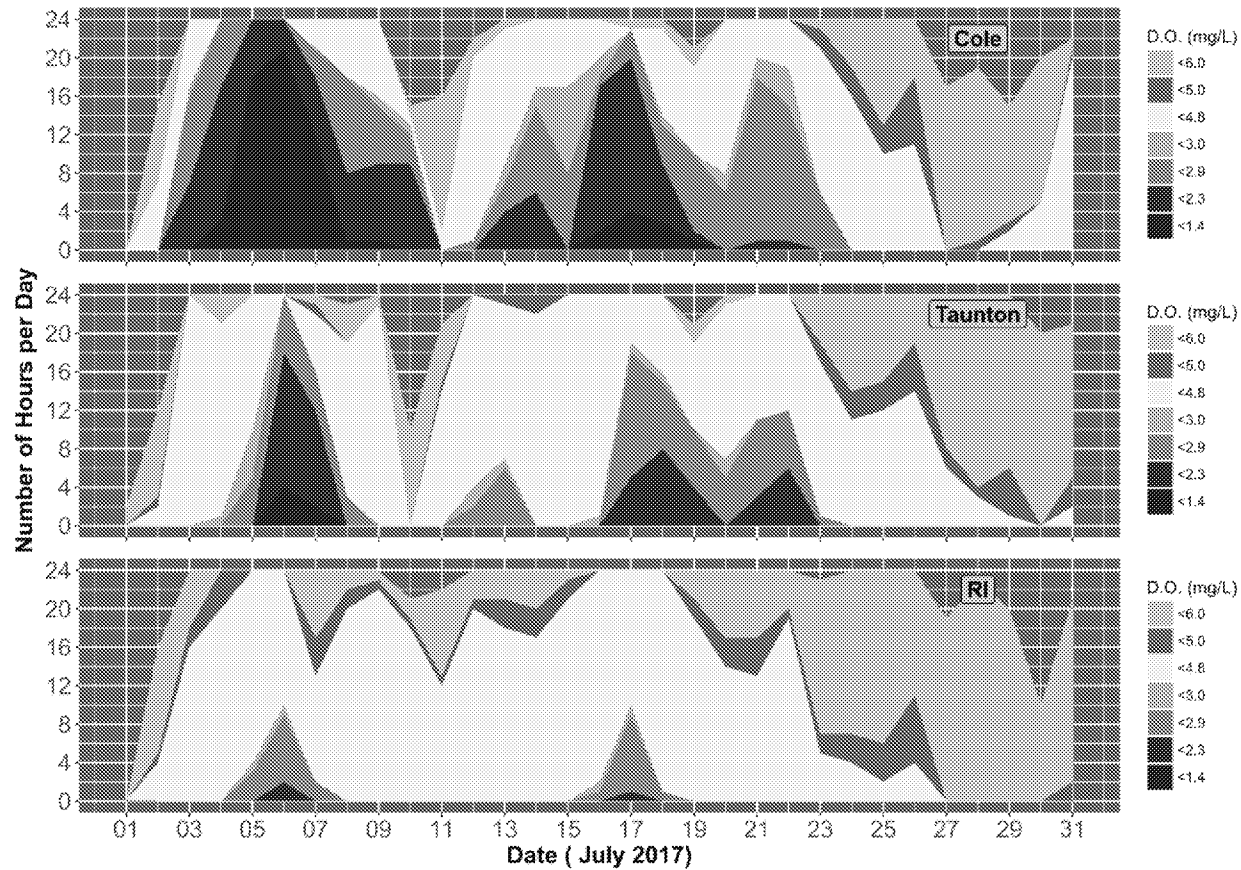
These data are currently being validated by  
MassDEP, Division of Watershed  
Management, and are considered DRAFT.

Taunton Buoy – Chlorophyll (ug/L) vs. Hourly Durations Below D.O. Thresholds (Bottom Sonde)



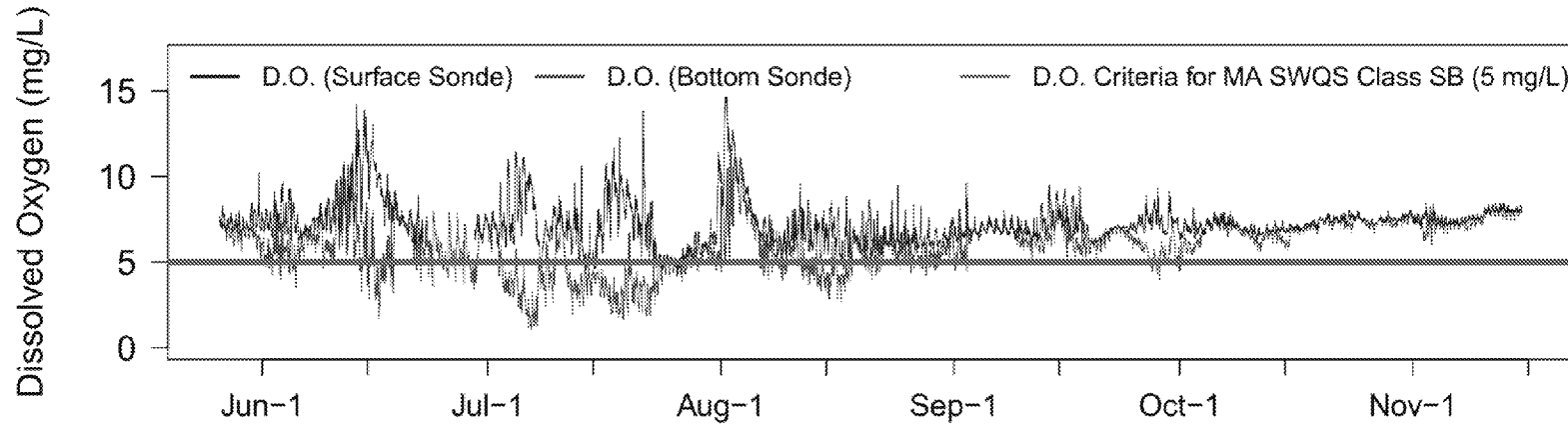
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Cole, Taunton, and RI MHB Buoys – July Hourly Durations Below D.O. Thresholds (Bottom Sondes)



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**Taunton Buoy – 2017 Dissolved Oxygen Data (mg/L)**



**Taunton Buoy – 2017 Temperature Data (°C)**

